

BEFORE THE FEDERAL COMMUNICATIONS COMMISSION

WASHINGTON, D.C., 20554

In the Matter of

Broadband Needs in Education,

GN Docket Nos. 09-47, 09-51, 09-137

Including Changes to E-rate Program to

CC Docket No. 02-6

Improve Broadband Deployment

WC Docket No. 05-195

NBP Public Notice #15

COMMENTS OF

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Patrick Lanthier, Chairman of the Emergency Communications Leadership & Innovation Center (eCLIC), files these brief comments in response to the Commission's NBP Public Notice #15 seeking comment, as part of the Commission's development of a national broadband plan, on the various issues related to broadband access in education. The Commission poses 14 categories of questions in this notice. While we may provide additional comments later, we will focus on Question 14, "OPEN CALL", which seeks "additional case studies, research, and other evidence that may provide additional insight..."

"Connected, Protected, Educated Communities - CPEC"

Our key recommendation to the Commission is that it seeks to help create a holistic approach to Broadband Needs in Education by actively including the safety needs of educators, students and their communities. After all, school safety is a prime responsibility for all educators. We have clearly demonstrated that schools-centered innovative wireless broadband technologies coupled with collaborative teamwork (schools, police, fire, parks, health, transportation, special access needs, local organizations) produce unparalleled synergistic effects that create immediate impacts for school safety, community safety, and education. In our example, explained below, schools-centered wireless broadband networks are used daily for educational purposes, school safety, community protection, and, when needed, in emergency response and recovery. Our approach, "Connected, Protected, Educated Communities", was developed after decades of real-world field experience and with inputs from scores of experts around the globe. We are now at a time when wireless broadband is very cost effective, increasingly powerful and capable. We stand ready to assist the Commission as it seizes the moment to help create "Connected, Protected, Educated Communities"...via its National Broadband Plan.

The following information describes eCLIC, LINC and our proposed LINCTEST:

eCLIC, the **EMERGENCY COMMUNICATIONS LEADERSHIP & INNOVATION CENTER**, is a non-profit WCA SIG (Wireless Communications Alliance – Special Interest Group) that serves as an open forum to stimulate the advancement and widespread use of Wireless Broad Band networks and Collaborative Common Operational Picture applications for emergency services and protection management for both disaster response/recovery and daily use.

The eCLIC goal is to realize a user-friendly "point and click" application-rich wireless world for emergency responders and protection managers (specifically including schools), so that we can enjoy "**CONNECTED AND PROTECTED COMMUNITIES**"...now, via broadband technologies.

eCLIC applies decades of field experience, focusing its efforts on three critical areas that comprise the "eCLIC Success Triad" :

1. Visionary Leadership (Policies, Procedures, Collaborations, Funds),
2. Hard Infrastructure (Innovative Technology, Networks), and,
3. Soft Infrastructure (Skills, Training, Applications).

The first eCLIC Pilot Project, **LINC**, the **LIVERMORE INFO NET COLLABORATIVE** is underway. This collaboration includes the Livermore Valley Joint Unified School District, Lawrence Livermore National Laboratory, Livermore/Pleasanton Fire Dept., Livermore Police Dept, the Governor's Office of Emergency Services (CalOES/EMA), Sandia Labs, and others. LINC was successfully demonstrated during district-wide emergency drills. For the first time,

collaborative managers (above) viewed live video and sensors inputs on interactive map-based Common Operational Picture computer screens. The wireless high speed network also provided connections for the local community's "tent city" that was developing on the school fields (the Loma Prieta (1989) quake actually created such "tent cities" on school grounds in California).

User-centered "democratized innovation" principles guide eCLIC projects (see MIT's Dr. Eric von Hippel's work). LINC, and eCLIC leverage investments from, and experience with, the U.S. Department of Homeland Security's Information Technology Evaluation Program, the U.S. Naval Postgraduate School's Hastily Formed Networks program, the National Incident Management System, the Golden Gate Safety Network, CalOES, and other national and international efforts...using today's technologies.

Good ideas, proposals, volunteers, supporters and sponsors are welcome. Currently, eCLIC has an International Advisory Board and a small Leadership Group led by Chairman Pat Lanthier < eclicsig@wca.org > and Co-Chairman Charles Brown. Additional information is available on the Wireless Communications Alliance website < www.wca.org >.

LINC: Livermore Info Net Collaborative & LINCTEST: Livermore Info Net Collaborative Technology Experiences for Students & Teachers

LINC currently creates and sustains a Connected, Protected, Educated Community. Connections are wireless broadband nets, designed and tested (via a unique Dept. of Homeland Security program) to serve both education and community protection needs. In emergencies, LINC enables the highest level of multi-entity collaboration & situational awareness for emergency response and recovery (video, data, maps, common operational picture, locators, sensors, etc.).

LINCTEST leverages and extends LINC to develop Science, Technology, Engineering and Mathematics (STEM) skills and to further the LINC development and deployment for improved community protection, emergency preparation, education and employment in the State .

STATUS : From Livermore to >>> other California areas

LINC is currently operating in Livermore. Via LINC, 19 schools serve as broadband communications hubs - both daily and during emergencies. LINC reliably serves students, teachers, administrators, safety personnel, and the community. LINC succeeds because of collaborative people networks, advanced technical networks, useful applications, and innovative leadership (schools, police, fire, parks, transportation, laboratories, military, functional needs, under-represented, etc). LINC leverages past investments and learning from a variety of sources, to create synergy and maximize returns on investment/innovation. At our demo, an experienced observer called LINC "a School District of the future" approach - connected with police, fire, and other vital entities. We are not aware of any other LINC-level deployments in the country.

While LINC is robustly operational (3 years), **LINCTEST** is a proposal to leverage LINC to:

1. Develop the LINC approach so it better serves the community. This includes serving those with access & functional needs, STEM development for under-represented groups, and community outreach (healthcare, businesses, etc.) to support New Economy job creation;
2. Refine LINC, to include alternative/emergency power, innovative wireless local/backhaul networks, new info fields (health, etc.), alternative internet links, and operational procedures;
3. Replicate LINC, via “LINC in a Box”, to other areas - with documentation/support to facilitate rapid replication/improvement of LINC (use “Local”), including a Linux-like “Democratized Innovation” approach based on Dr.Von Hippel’s work at the MIT Innovation Group.

Supporters & Collaborators (partial list): Former Rep. Ellen Tauscher; K.G. Ouye, Former e-Rate CEO; Dr. Carol Ort, UNR Scientist/V.Provost; Dr. Wm. Dunlop, Senior Scientist, LLNL; Profs. Brian Steckler & Alex Bordetsky, US Navy Postgraduate School; Dr.K.Bowers, LVJUSD Asst. Supt.; Prof. Larry Press, CSUDH; C. Brown, CEO, WNI; Richard Devylder & George Lowry, Cal Emergency Mgmt Agency; Cal Econ Strategy Panel; Wireless Communications Alliance; Livermore Police, Fire; Livermore Area Recreation and Park District.; Wheels Transport; Livermore Valley Education Foundation; the LLNL & UCDavis Teller Center, etc.

DESCRIPTION

Economic Recession! Inadequate Workforce! Natural and Manmade Disasters! Terrorism! Security Threats! Global Warming! and Under-representation! – Perhaps the sky is falling!

The Internet! WiFi! WiMax! Cellular 4G! Google! GoogleEarth! Yahoo! Facebook! Linux! Digital Cameras! PDAs! Telemedicine! Telework! – Wow, what a wonderful world!

So, are we in America currently experiencing the worst of times, or the best of times? Will things get better or worse? Perhaps both NSF personnel and LINCTEST Roundtable members would say: “It all depends on our ability to empower all Americans to innovate and create, using and improving the wonderful new tools at our disposal. Such widespread empowerment is dependent upon universal STEM-based skills development, ubiquitous access to, and active use of, collaborative networks, and visionary leadership”.

The dichotomy suggested above was described in the early 1990’s as the “New Economy” by the California Economic Strategy Panel (Collaborating to Compete in the New Economy). The CalESP characterized the New Economy as:

1. Global,
2. Fast,
3. Networked, and
4. Knowledge-worker dependent.

During the CalESP deliberations, a fifth characteristic was also discussed: “ruthless”. In the early 1990s, the discussions about ruthlessness centered on job losses and the development and nurturing of knowledge workers – also known as STEM graduates (Science, Technology, Engineering, Math). At that time, factory job losses in California alone exceeded an estimated 500,000. California public and private leaders soon established bold collaborations (The

California Intelligent Network Task Force, CalESP, Project California, Joint Venture Silicon Valley, Smart Valley, the Wireless Communications Alliance, New Regulatory Framework, CalREN –California Research & Education Network, Education First, California Education Technology Taskforce, etc.).

Of nine CalESP recommendations, the first two were: 1. Improve the Workforce Preparation System and, 2. Create a Technology-rich K-12 Schools Framework. Implementation involved hundreds of millions of “jump start”, not market-driven, dollars. “Red Teams” were created to target workforce transformations and regulatory policies were changed to enable the largest and quickest analog to digital telecommunications infrastructure upgrade in the world (\$400M, 202 switching centers, 100s of carrier systems, 50% of California’s geography – all done in less than 2 years). More than \$600M of improvements followed, via additional regulatory changes enabled by a “New Economy” collaborative policy environment largely driven by enlightened community, business, and education leaders.

The results: by the mid/late 1990’s, California regained all of its lost jobs, added more, and clearly established its trillion-dollar economy as a world-wide innovation leader. The added jobs were largely in the “Engineer/Management Services” sector, with wages at an impressive 75.2 % above the U.S. Average (per CalESP, Cal Employment Development Department, and the U.S. Bureau of Labor Statistics). In addition, a new class of Knowledge Workers emerged. They called themselves “Lone Eagles” (per a CalESP rural meeting), but most policy wonks called them “Teleworkers” (J.Nilles, from NSF, coined the term). Many “Lone Eagles” were STEM workers who choose to physically live in a bucolic rural setting while they worked, worldwide, with other STEM workers via this new thing called the Internet.

Policy wonks observed what was occurring in California. Ralph Nader said: “An intelligent network is the only way to bring technology to the masses, and Pacific Bell is going about it the right way – by bringing consumers in to talk about what they want. After all, technology is not its own imperative”. Andrew Barrett, FCC and former State Utilities Commissioner, said: “The California Intelligent Network Task Force foresaw numerous ways in which the Intelligent Network could be used to enhance the quality of life of Americans and avoid the inequities of an information rich / information poor split society”. Please note that the California Intelligent Network Task Force was also called “CACX” – Consumer Advisory Council # 10. Additional CACs, with visionaries such as K.G. Ouye, (later, CEO of the national “E-Rate” program, now a LINCTEST Roundtable member) helped us design discount and deployment /service plans for schools, for the disabled, for English language learners, and the unemployed.

We mention all of this in our LINCTEST proposal because:

1. America is operating in a New Economy and a dangerous world, with a potential workforce that is underdeveloped in the important STEM areas,
2. Americans everywhere (including students, teachers, the underrepresented) can use amazing new technologies and applications to learn, apply and enhance STEM in fun and exciting ways,
3. Our experienced LINCTEST team has decades of research, development, and actual field leadership (CEO, President, Chair, Vice-Provost, Asst. Superintendent, etc.) in projects like those cited above (and, many, many more around the globe),

4. We have a unique opportunity to leverage existing partnerships with Lawrence Livermore National Laboratories and the University of California's Edward Teller Education Center, the U.S. Naval Postgraduate School, local public agencies, businesses and several foundations/associations and affinity groups associated with the underrepresented, and
5. We will open our high speed (100Mb/s+) wireless network (LINC : Livermore Info Net Collaborative) to teachers, students and qualified families so that they all have a world class "testbed" to explore the wonders of STEM and they all have opportunities to help create communities that are "Connected, Protected, and Educated". The LINC network will offer a leapfrog opportunity for many sectors in Livermore, enabling applications such as telework, advanced disaster preparedness and response, Open Textbooks (per J.Sanger, Journal of Higher education, 2008), and interactive multi-cultural video links to the most innovative STEM educators. The LINC network also provides valuable data gathering and access control capabilities that will greatly enhance research and evaluation for the NSF ITEST program.

Our LINCTEST approach is a holistic, total-immersion approach to STEM career development, based primarily on decades of field research, development and application by all members of the LINCTEST Roundtable.

We will study the impact of this LINC-based innovative professional development model for improving student understanding of STEM, teacher understanding of content and pedagogy and home/community support for accelerated STEM learning. Our holistic approach will bring together selected community and partnership representatives, selected K-12 teachers and students (with an emphasis on the underrepresented). We plan to integrate our unique LINC network-based LINCTEST activities into established community activities such as the Spring and Fall School Emergency Exercises, Summer Schools, Future Farmers of America, Police and Fire Departments Community Outreach, and Foundation / Affinity Group activities (e.g.: Latino, Native American, Pacific Islander, etc.

LINCTEST is a three year program. We are currently planning these key activities:

1. Planning, Community / Teacher / Student Outreach
2. Spring / Fall Emergency Exercise days, coupled with LINCTEST Demo/Expo days, total of 6 events (2 events x 3 years)
3. LINCTEST Summer Schools – 1 for each level (Elementary, Middle, High) per year, total of 9 events (3 events x 3 years)
4. Additional Partnership & Community Activities with LLNL / ETEC, NPS, businesses, public safety, government, foundations, affinity groups, total of 30 events (10 events x 3 years) note: This includes selected extensions of LINC into selected homes.
5. Annual Reports, Final Report, and Formal Presentations, 4 reports and 3 presentations, total of 7 events

We see the Spring and Fall Emergency Exercises as two-day premiere events, with one day as an official exercise that uses our advanced LINC capabilities (network, cameras, remote/shared management, common operational picture, sensors, etc., and another day as a STEM Demo/Exploration day with STEM interactions, presentations and recognitions for teachers, students, families, and local groups. We have completed two School District-wide Emergency Exercises using the LINC network with a number of partners. These were official exercises

involving the actual School District personnel assigned to emergency management and the actual Public Safety personnel (Police, Fire, etc.) who would be dispatched. In addition, other participants included our partners from Lawrence Livermore National Labs and the Naval Postgraduate School.

Both of these Exercises were very successful. A very experienced California State Board of Education Administrator observed that no other school district in California was using technology and collaboration as advanced as Livermore and it seemed to him that he was experiencing “the School District of the Future” in Livermore. Based on the LINC experience, we also discussed a possible revision to California State guidelines on School Emergency Management, so that schools may serve as valuable Communications Hubs for communities. Another observer, a knowledgeable Communications Chief from the California Governor’s Office of Emergency Services, noted that Livermore was definitely leading the way.

Globally, ICT (Information & Communications Technology) is increasingly permeating virtually all sectors of successful societies and ICT leadership increasingly determines the success of business, governmental and humanitarian efforts. Good ICT saves lives! ICT leadership is created by STEM (Science, Technology, Engineering, and Math) graduates. However, U.S. educators are not producing enough STEM graduates and U.S. student’s interest in STEM studies seems to decline as they progress through K-12 grade levels. When underrepresented groups’ issues are added, then a particularly ominous trend seems to be growing in America. We desperately need to:

1. Stimulate students interest in STEM (make STEM fun and relevant for all),
2. Equip and recognize innovative STEM-inspiring teachers at all K12 levels,
3. Document “Best Practices”, guides, innovations, hurdles that flow from the field,
4. Collaborate broadly to leverage synergistic efforts and inclusive endeavors.

The experienced LINCTEST team is dedicated to achieving the objectives above.

INTELLECTUAL MERIT

LINCTEST is a potential NSF ITEST Strategies project that leverages LVJUSD’s unique existing ICT capabilities and public/private relationships with Lawrence Livermore National Laboratories, Sandia Labs, U.S. Naval Postgraduate School, California Governor’s Office of Emergency Services, California Economic Strategy Panel, and agricultural / communications / energy / environmental / health / safety / security / transport technologists (more than fifty). We will apply our proven track record of successful collaborations as we focus LINCTEST on the Design, Implementation, and Synthesize components of the DRL Cycle to help cultivate a world-class, broadly inclusive science and engineering (STEM) workforce. LINCTEST will be a community-centered project involving students, teachers, administrators, parents/care-givers, and public/private partners. Outreach will help identify and motivate our growing number of under-represented potential STEM students, while our hands-on approach will demonstrate how a STEM career can be exciting, relevant, and really important for a student, her family and her community. The time is right for LINCTEST. LVJUSD is uniquely positioned to initiate LINCTEST – now! Via our recent LINC (Livermore Info Net Collaborative) project, we are the only school district in California that has collaboratively designed, implemented, tested and

demonstrated a multi-location, multi-jurisdiction (with police, fire, OES, community, etc.) wireless broadband network coupled with advanced DHS-sponsored Common Operational Picture (COP) software, video, vehicle/personnel locators, ultra-wide band sensors, radio interoperability and Hastily-Formed Network (HFN) satellite connectivity.

BROADER IMPACTS – “Connected, Protected, Educated Communities”

We are demonstrating a holistic, total immersion, “Connected, Protected, Educated Communities” approach and we want to demonstrate more of what is possible via Broad Band Wireless Internet Protocol networks. We want students, teachers, administrators, parents, and public/private partners to help explore more possibilities as we Design, Implement, and Synthesize via LINCTEST. LINCTEST leadership is ready to apply decades of global ICT project experience (U.N., U.S.AID, DHS, DOD, DOE, NGOs, States, Regions, Cities, etc.). In addition to our LINC resources and experience, we have a successful history with diverse Livermore community supporters who would supply real-life motivations for potential STEM students in areas such as: agriculture, art, biology, communications, energy, government, healthcare, safety, and transport. We have already extended our LINC school-based network to serve emergency responders, we now plan to extend LINC to homes of underrepresented STEM students, with support.

We believe our LINCTEST holistic / total immersion schools + community + homes approach will produce many inspired STEM kids from all sectors of our community. The range of our activities will be impressive. Just a few examples are: We plan to link into our school district's farm (yes, LVJUSD has operated an animal farm for decades, with offerings in biology, ag business, wildlife management, and more), link into public safety (with police and fire), link into water management (with water utilities), create a LINCTEST student wireless deployment and development team (with network technology companies), and more.

LINCTEST Team – The LINCTEST Roundtable

The LINCTEST Roundtable is a team of seven very experienced equals. All team members have successfully created, developed, and managed major projects that have created significant and lasting results. The following are brief role and biographical descriptions. Two page biographical sketches are included elsewhere in this package.

Pat Lanthier – LINCTEST Principal Investigator

Principal of RIVERA/LANTHIER and Associates (*“Development for the New Economy”*); Founder & Chairman of the Emergency Communications Leadership & Innovation Center (eCLIC); Co-Founder and Co-Chairman of the International Emergency Communications & Disaster Management program at the Pacific Telecomm Council, past Co-Founder/President of Wireless Networks, Inc., the Mother Lode -eXpress- Rural Broadband Initiative, and the San Mateo Information & Learning Enterprise (SMILE) program; Advisor to the California Economic Strategy Panel, the California Governor's Office of Emergency Services (Extensible Emergency Operations Center) the U.S. Department of Homeland Security (Information Technology Evaluation Program), the Corporation for Education Network Initiatives in California, the Great

Valley Center, the Wireless Center at California State University, the Broad Band Institute at Santa Clara University, the Livermore Info Net Collaborative (LINC), and others.

For 25+ years, co-led dozens of advanced ICT (Info/Comms Technology) projects around the world: in Africa, Europe, South America, South East Asia, the Caribbean and North America; with AT&T, Bell Labs, Bell Communications Research, Pacific Telesis Group, Price Waterhouse, etc. Testified in the U.S. Congress, European Union, African and U.S. State Senates, Advised the United Nations, U.S. Congress, European Union, U.S. Agency for International Development, Pacific Telecom Council, various State/Regional/and Local agencies, Universities, Companies (SAIC, SRI, Mitre, CETF, UNISYS, etc.) and Communities; elected five times as the New Technologies National Chairman of the 1200 company, \$300B, United States Telephone Association and a ten-year Director of the Wireless Communications Alliance; served on the U.S. National Security and Emergency Preparedness Team, the California Network Reliability Team, the California Education Technology Task Force, the California Research and Education Network, Project California, the Intelligent Network Taskforce, etc.; university lecturer; NIMS (Nat'l Incident Mgmt System) certified and educated at the Wharton School, Seton Hall, California Polytechnic, Golden Gate and S. F. State.

Kelly Bowers – Volunteer - Asst. Superintendent, LVJUSD; Distinguished Educator, Doctoral Candidate at UC Berkeley, Tech Plan Developer, Spanish Speaker

Dr. Bill Dunlop – Volunteer - LLNL Senior Scientist, National Security, School Board Trustee, Nuclear Physicist, International Disarmament Leader, School Innovator

Pauline Mingram - Finance and Project Management, Major Library Projects background

Dr. Carol Ort – Evaluator, Distinguished University Vice-Provost, Biologist, Researcher, Teacher, Advisor, Mentor, and Young Women in Science Leader

KG Ouye – Operations and Community Outreach, Local / State / National Library Manager and Innovator, Chair of the Cal Ed Tech Task Force, First Chief Executive Officer of the National E-Rate Program

Brian Steckler - Wireless Advisor, Naval Postgraduate Professor, Disaster Relief and international emergency response/recovery expert (Katrina, Indonesia, Thailand, etc.)

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